

REPORT NUMBER: 301-MGA-2009-002

**SAFETY COMPLIANCE TESTING FOR FMVSS 301R
FUEL SYSTEM INTEGRITY – REAR IMPACT**

**FORD MOTOR COMPANY
2008 FORD SD F250 4X2 REG CAB
NHTSA NUMBER: C80211**

**PREPARED BY:
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Test Date: April 14, 2009

Final Report Date: April 22, 2009

FINAL REPORT

**PREPARED FOR:
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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WASHINGTON, D.C. 20590**

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16. Abstract A rear impact was conducted on a 2008 Ford SD F250 4X2 Reg Cab at MGA Research Corporation on April 14, 2009. This test was conducted to obtain data indicant of FMVSS 301R. The impact velocity was 79.7 km/h. The ambient temperature at the time of impact was 6.6 degrees Celsius.			
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This rear impact test is sponsored by the National Highway Traffic Safety Administration (NHTSA) under contract number DTNH22-06-C-00030. The purpose of this test is to reduce deaths and injuries occurring from fires that result from fuel spillage during and after motor vehicle crashes and resulting from ingestion of fuels during siphoning.

SUMMARY

A 2008 Ford SD F250 4X2 Reg Cab was impacted by a Moving Deformable Barrier (MDB) at a velocity of 79.7 km/h. The test was performed at MGA Research Corporation on April 14, 2009. Pre-and post-test photographs of the vehicle and dummies can be found in Appendix A.

One real-time camera and four high-speed cameras were used to document the impact event.

- Left Rear Half 1000 fps
- Right Rear Half 1000 fps
- Overhead Overall 1000 fps
- Right Overall 1000 fps
- Real Time Pan 24 fps

Two ballast Part 572E, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

There was no Stoddard Solvent leakage after the event or during any phase of the static rollover.

The vehicle appeared to comply with all the requirements of FMVSS No. 301 "Fuel System Integrity."

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
Test Date: 4/14/2009

TEST VEHICLE INFORMATION

Manufacturer	Ford Motor Company
Model	F250 4x2 Reg Cab
Body Style	2 Door Pick Up
Major Options	Styleside
NHTSA No.	C80211
VIN	1FTNF20548ED17418
Color	Oxford White
Delivery Date	3/26/2009
Odometer Reading (mile)	708
Dealer	Ricart Ford
Transmission	Automatic
Final Drive	Rear Wheel Drive
Number of Cylinders	8
Engine Displacement (L)	5.4
Engine Placement	Longitudinal

DATA FROM VEHICLE'S CERTIFICATION LABEL

Manufactured By	Ford Motor Company
Date of Manufacture	01/08

GVWR (kg)	3992
GAWR Front (kg)	1724
GAWR Rear (kg)	2673

VEHICLE CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bench			
Number of Occupants	3			3
Capacity Wt. (VCW) (kg)				1327
Number of Occupants x 68 kg.				204
Cargo Wt. (RCLW) (kg)				1123

DATA SHEET NO. 1 (continued)
TEST VEHICLE SPECIFICATIONS

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
 Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
 Test Date: 4/14/2009

DATA FROM VEHICLE'S TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	450	515
Recommended Tire Size	LT245/75R17E	LT 245/75 R16
Recommended Load Range	E	E
Tire Size on Vehicle	LT245/75R17E	LT245/75R17E
Tire Manufacturer	Continental	Continental
Location of Placard of Vehicle	Driver's Door At B-Pillar	
Type of Spare Tire (full size/space saver)	Full Size	

DATA SHEET NO. 2**PRE-TEST DATA**

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
 Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
 Test Date: 4/14/2009

WEIGHT OF TEST VEHICLE

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	741.6	727.1		758.4	842.8	
Right	kg	741.2	744.4		765.7	865.0	
Ratio	%	50.2	49.8		47.2	52.8	
Totals	kg	1482.8	1471.5	2954.3	1524.1	1707.8	3231.9

CALCULATION OF TARGET TEST WEIGHT (TTW)

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2954.3
Rated Cargo/Luggage Weight (RCLW)	kg	136
Weight of 2 P572E ATDs	kg	148
Calculated Vehicle Target Weight (TVTWT)	kg	3238.3

Vehicle Wheelbase	3491
Vehicle Width	2008
Weight of Ballast secured in Bed of Truck	154.7 kg
Method of Securing Ballast	Bolts
Vehicle Components Removed for Weight Reduction	None

VEHICLE ATTITUDES

	Units	LF	RF	LR	RR
As Delivered	mm	928	922	898	896
As Tested	mm	926	924	891	885

DATA SHEET NO. 2 (continued)**PRE-TEST DATA**

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
Test Date: 4/14/2009

FUEL SYSTEM DATA

	Units: Liters
Usable Capacity of "Standard Tank" (Owner's Manual)	143.8
Usable Capacity Figure Furnished by COTR	143.8
Usable Capacity of "Optional" Tank	
92-94% of Usable Capacity	132.3 to 135.2
Actual Test Volume (entire fuel system filled)	133.2

Test Fluid Type	Stoddard Solvent
Test Fluid Kinematic Viscosity (centistokes)	2.1 cSt @ 20° C
Test Fluid Color	Purple
Type of Vehicle Fuel Pump	Electrical
Activate Electric Fuel Pump Operation with Ignition Switch ON, but Engine OFF	Yes

Comments (noticeable attributes of fuel system components, capacity, etc.)	None
--	------

DATA SHEET NO. 3
MOVING BARRIER DATA

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
 Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
 Test Date: 4/14/2009

MOVING BARRIER'S TEST WEIGHT

	Units	Front	Rear	Total
Left	kg	374.2	308.8	
Right	kg	389.5	291.2	
Ratio	%	56.0	44.0	
Totals	kg	763.7	600.0	1363.7

Tires (Mfr, line, size)	Yokohama
Tire Pressure (kPa)	207
Brake Abort System (Yes/No)?	Yes
Date of Last Calibration	8/6/2008

DATA SHEET NO. 4**POST-TEST DATA**

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
Test Date: 4/14/2009

IMPACT VELOCITY

	Units: km/h
Required Impact Velocity	80.0
Actual Impact Velocity (Trap No. 1)	79.7
Actual Impact Velocity (Trap No. 2)	79.7
Average Impact Speed	79.7

Temperature at Time of Impact (°C)	6.6
Test Time	2:08 pm

WELDING ROD IMPACT POINT

	Units: mm
Vertical distance from target center (+ above target / - below target)	8 mm above
Horizontal distance from target center (+ to the right / - to the left)	12 mm to the right

DATA SHEET NO. 5 **STATIC ROLLOVER TEST DATA**

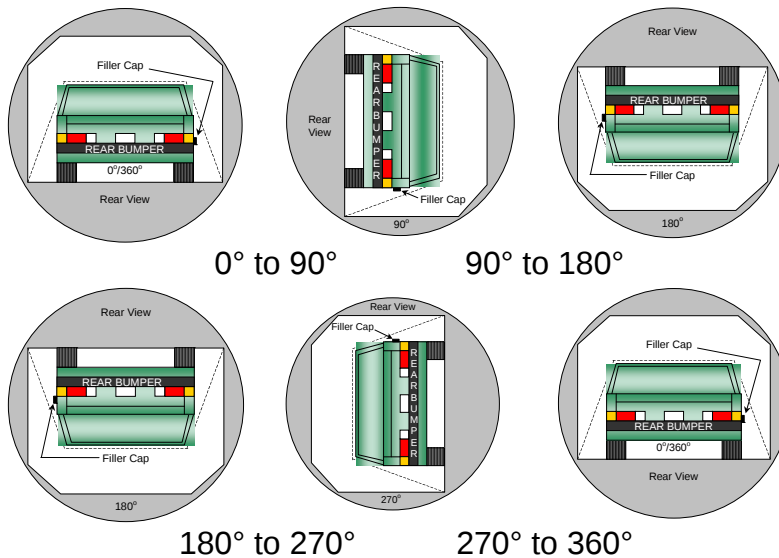
Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
 Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
 Test Date: 4/14/2009

STODDARD SOLVENT SPILLAGE MEASUREMENT

- A. From impact until vehicle motion ceases: 0 g
 (Maximum Allowable = 28 grams)
- B. For the 5 minute period after motion ceases: 0 g
 (Maximum Allowable = 28 grams)
- C. For the following 25 minutes: 0 g
 (Maximum Allowable = 28 grams/minute)
- D. Spillage: None

FMVSS 301 STATIC ROLLOVER DATA



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.

2. The position hold time at each position is 300 seconds (minimum).

3. Details of Stoddard Solvent spillage locations: **Not Applicable**

DATA SHEET NO. 5 (continued)
STATIC ROLLOVER TEST DATA

Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
 Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
 Test Date: 4/14/2009

STODDARD SOLVENT SPILLAGE MEASUREMENT
Hold Time = 5 minutes at all intervals

0° TO 90° Rotation Time (sec) = 113 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

90° TO 180° Rotation Time (sec) = 131 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

180° TO 270° Rotation Time (sec) = 130 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

270° TO 360° Rotation Time (sec) = 128 sec

Test Phase	Spillage (g)	Spillage Details
First 5 minutes from onset of rotation	0	
Sixth minute from onset of rotation	0	
Seventh minute from onset of rotation	0	
Eight minute if required	N/A	

FORM 1
TEST VEHICLE INFORMATION

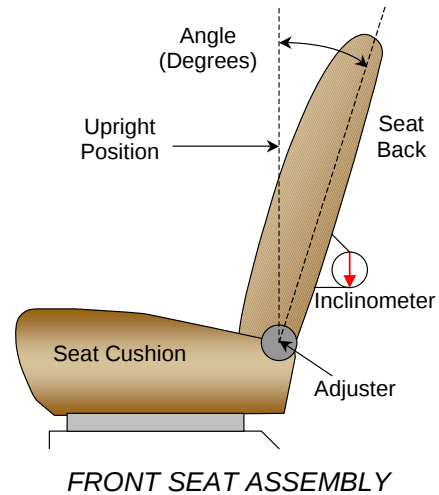
Test Vehicle: 2008 Ford SD F250 4X2 Reg Cab
Test Program: FMVSS 301 Fuel System Integrity

NHTSA No.: C80211
Test Date: 4/14/2009

NORMAL DESIGN RIDING POSITION

With the seat in the mid fore-aft seat track position the angle of the driver's seat back when it is in the nominal riding position, 17 degrees for bench seat and 21 degrees for 40% outboard seat.

Driver Seat Back Angle	17°
Passenger Seat Back Angle	21°



SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	17 detents	8 th detent, 1 st as 0
Passenger Seat	Fixed	Fixed

D-RING ADJUSTMENT

The driver and passenger D-rings were full up.

STEERING COLUMN ADJUSTMENT

The steering column was placed in the mid position.

APPENDIX A
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MFD. BY FORD MOTOR CO.

DATE: 01/08

GVWR: 8800LB/ 3992KG

FRONT GAWR: 3800LB

REAR GAWR: 5892LB

1724KG

WITH 2673KG

WITH

LT245/75R17E

TIRES LT245/75R17E

TIRES

17x7.5J

RIMS 17x7.5J

RIMS

AT 450 kPa/ 65 PSI COLD AT 515 kPa/ 75 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE.

VIN: 1FTNF20548ED17418

TYPE: Truck

F0273
T1089



EXT PNT:

Z1

RC: 47

DSO:

WB

INT TR

TP/PS

R

AXLE

TR

SPR

8F714

137

VS

7

37

T

FFFF

D05

UTC

▽5U5A-1520472-BA



TIRE AND LOADING INFORMATION

SEATING CAPACITY TOTAL : 3 FRONT: 3 REAR: 0

The combined weight of occupants and cargo should never exceed : **1327 kg or 2926 lbs.**

TIRE	SIZE	COLD TIRE PRESSURE
FRONT	LT245/75R17E	450 KPA, 65 PSI
REAR	LT245/75R17E	515 KPA, 75 PSI
SPARE	LT245/75R17E	515 KPA, 75 PSI

**SEE OWNERS
MANUAL FOR
ADDITIONAL
INFORMATION**

1FTNF20548ED17418

5U5A-1532-AA (TLU)

Vehicle's Tire Placard



Pre-Test Front View of Vehicle



Post-Test Front View of Vehicle



Pre-Test Left Side View of Vehicle



Post-Test Left Side View of Vehicle



Pre-Test Left Rear Close-up View of Vehicle

A-8.



Post-Test Left Rear Close-up View of Vehicle

A-9.



Pre-Test Right Side View of Vehicle

A-10.



Post-Test Right Side View of Vehicle



Pre-Test Right Rear Close-up View of Vehicle



Post-Test Right Rear Close-up View of Vehicle



Pre-Test Rear View of Vehicle

A-14.



Post-Test Rear View of Vehicle



Pre-Test ¾ Frontal View From Right Side of Vehicle



Post-Test $\frac{3}{4}$ Frontal View From Right Side of Vehicle



Pre-Test ¾ Rear View From Right Side of Vehicle



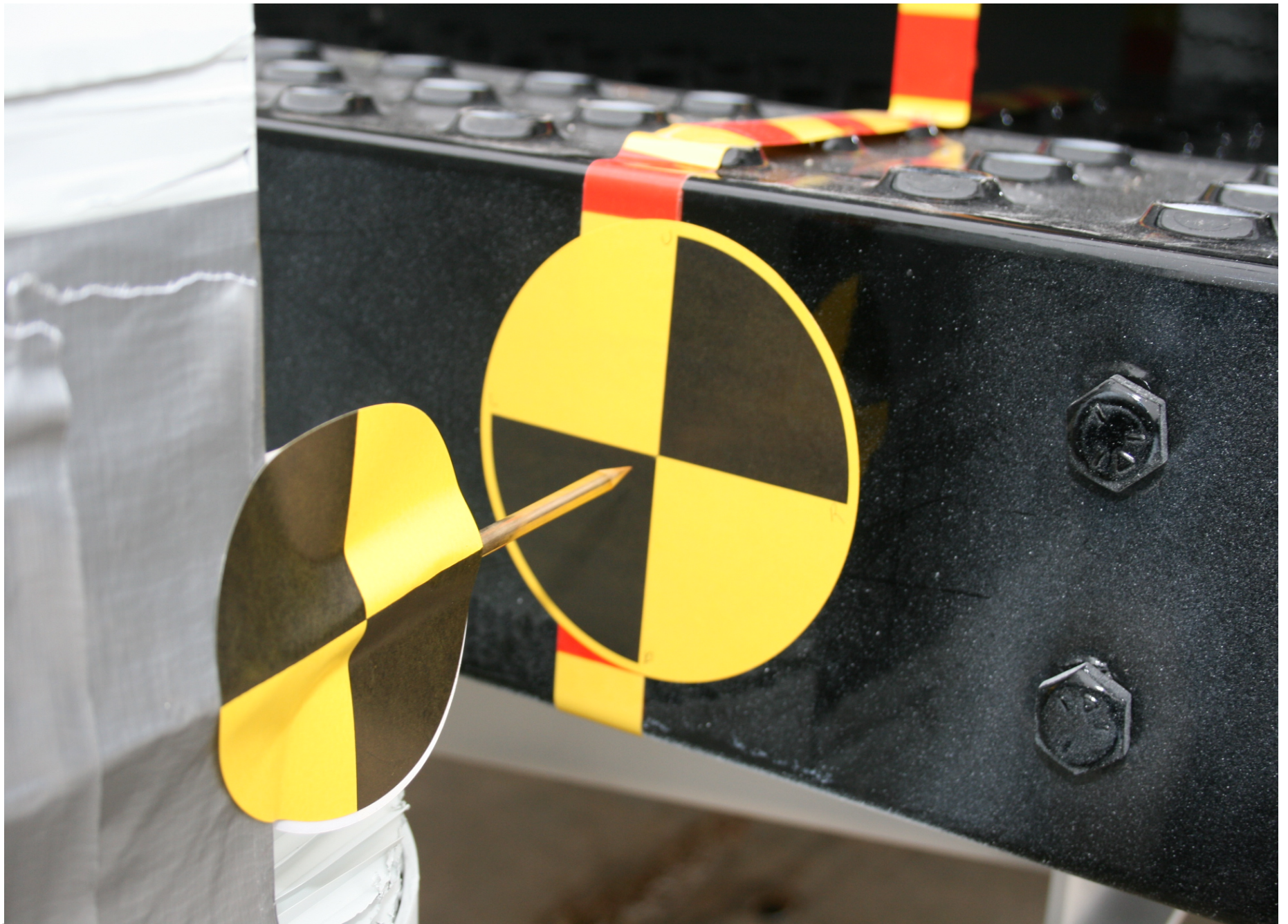
Post-Test $\frac{3}{4}$ Rear View From Right Side of Vehicle



Pre-Test ¾ Rear View From Left Side of Vehicle



Post-Test ¾ Rear View From Left Side of Vehicle

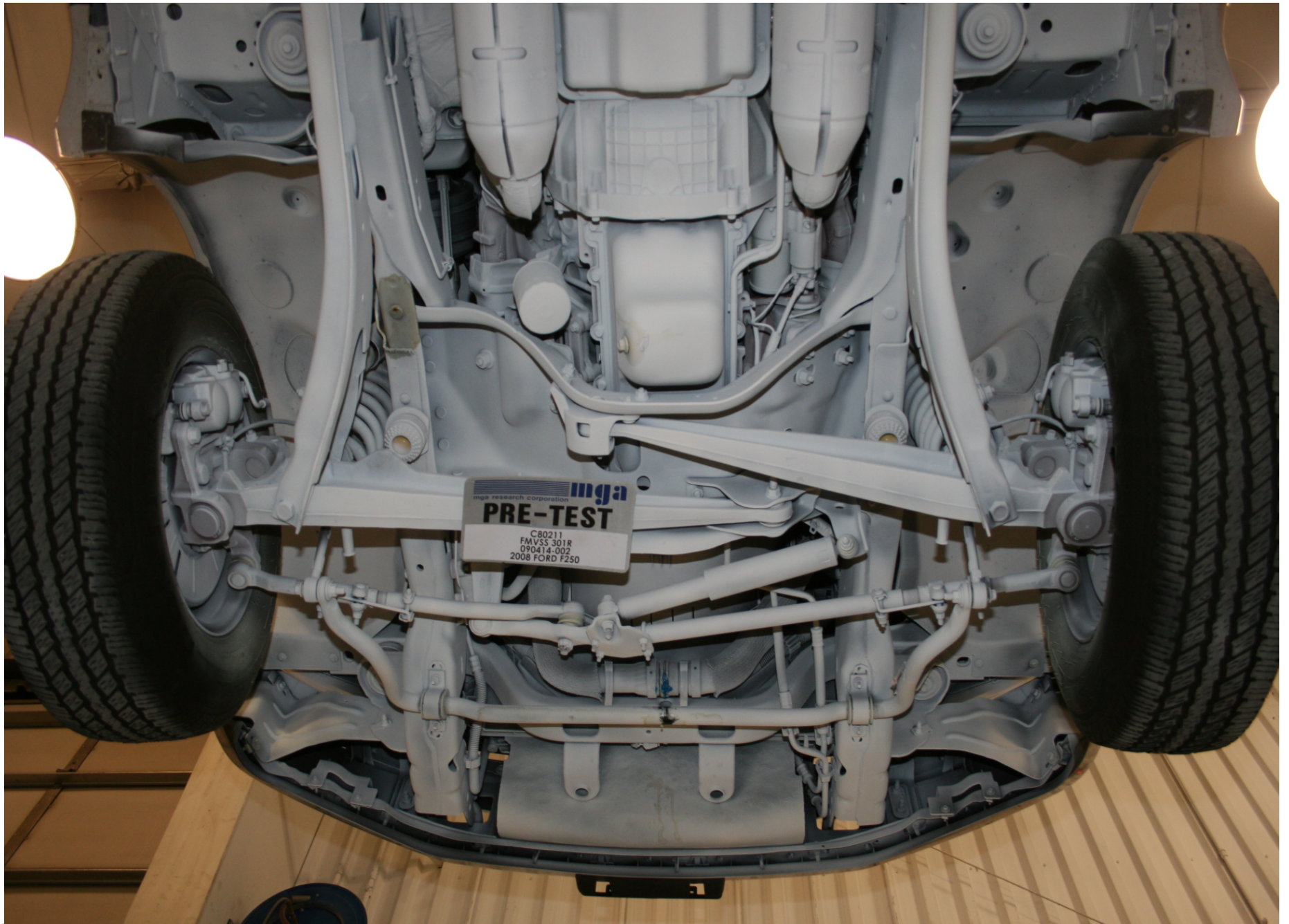


Pre-Test Impact Point

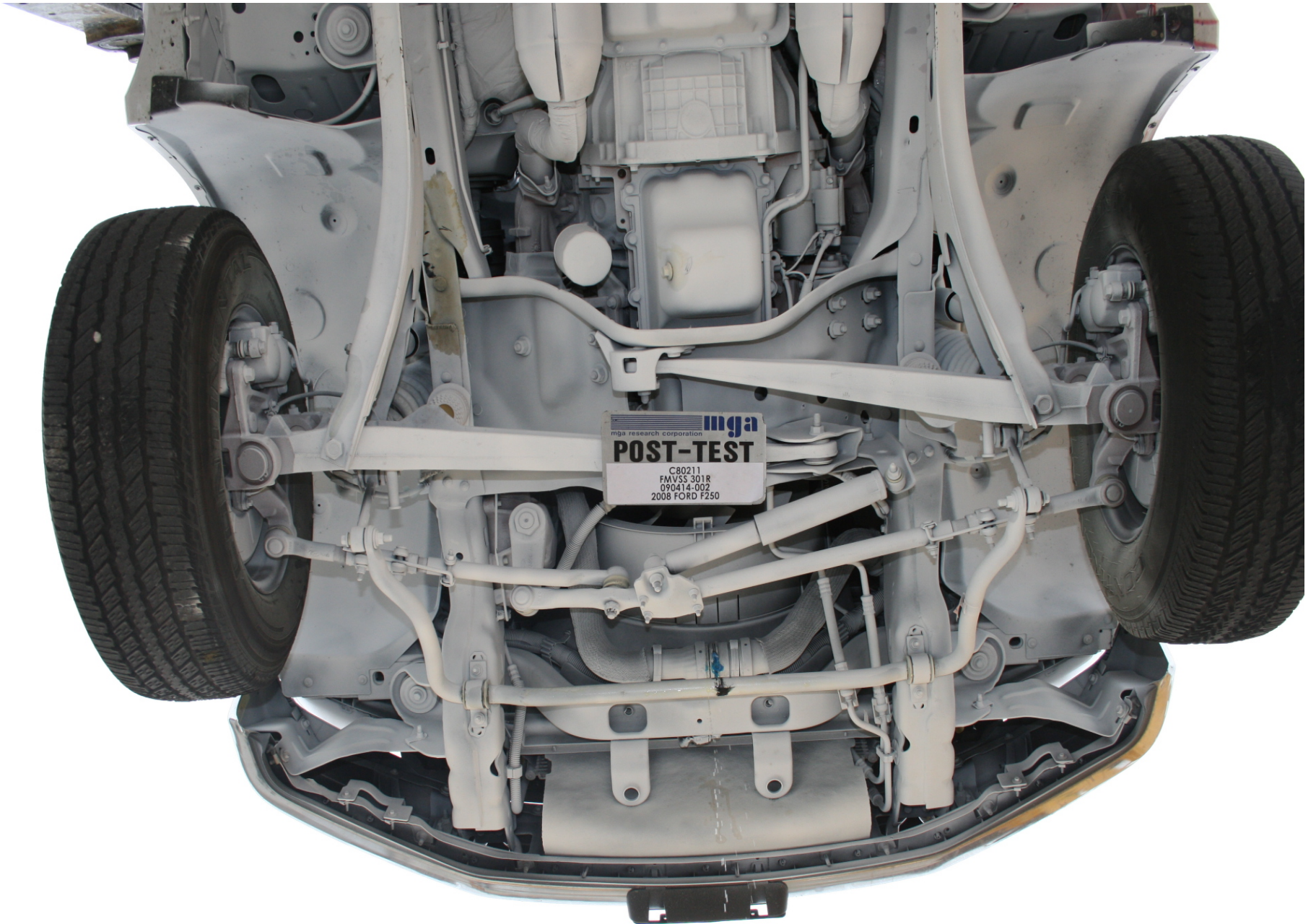


Post-Test Impact Point

A-23.



Pre-Test Underbody View 1



Post-Test Underbody View 1

A-25.



Pre-Test Underbody View 2



Post-Test Underbody View 2

A-27.



Pre-Test Underbody View 3



Post-Test Underbody View 3



Pre-Test Underbody View 4

A-30.



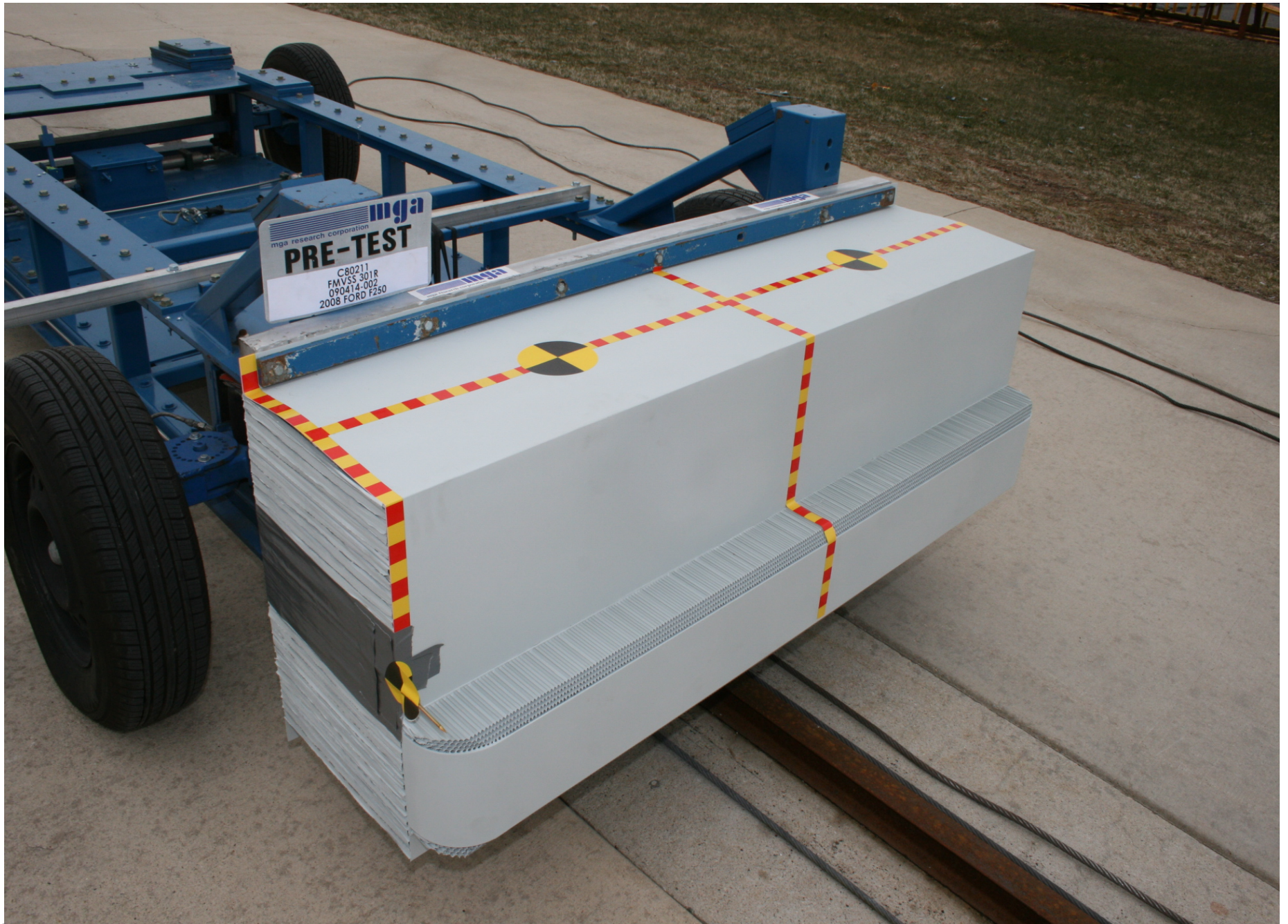
Post-Test Underbody View 4



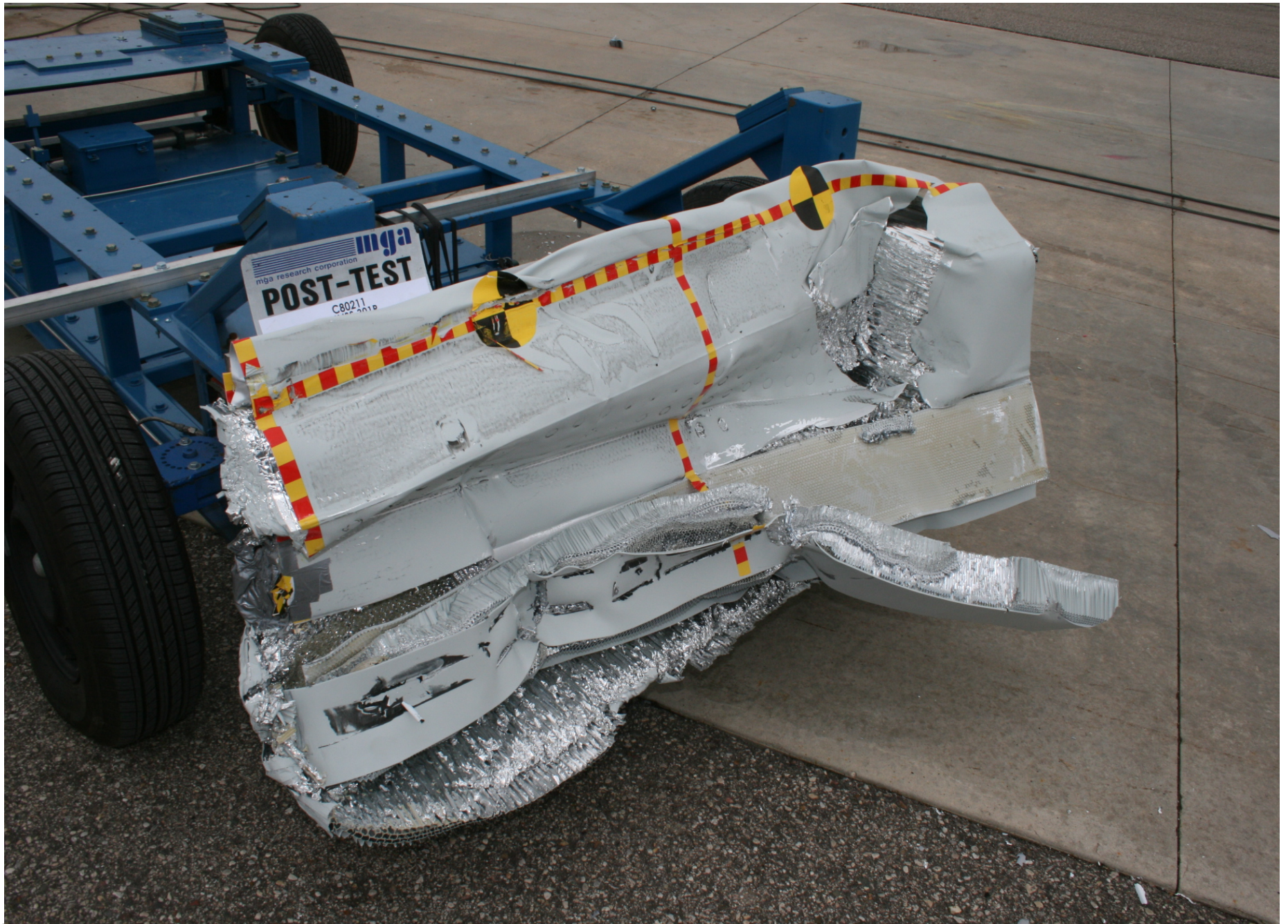
Pre-Test Front View of MDB



Post-Test Front View of MDB



Pre-Test $\frac{3}{4}$ Right Side View of MDB



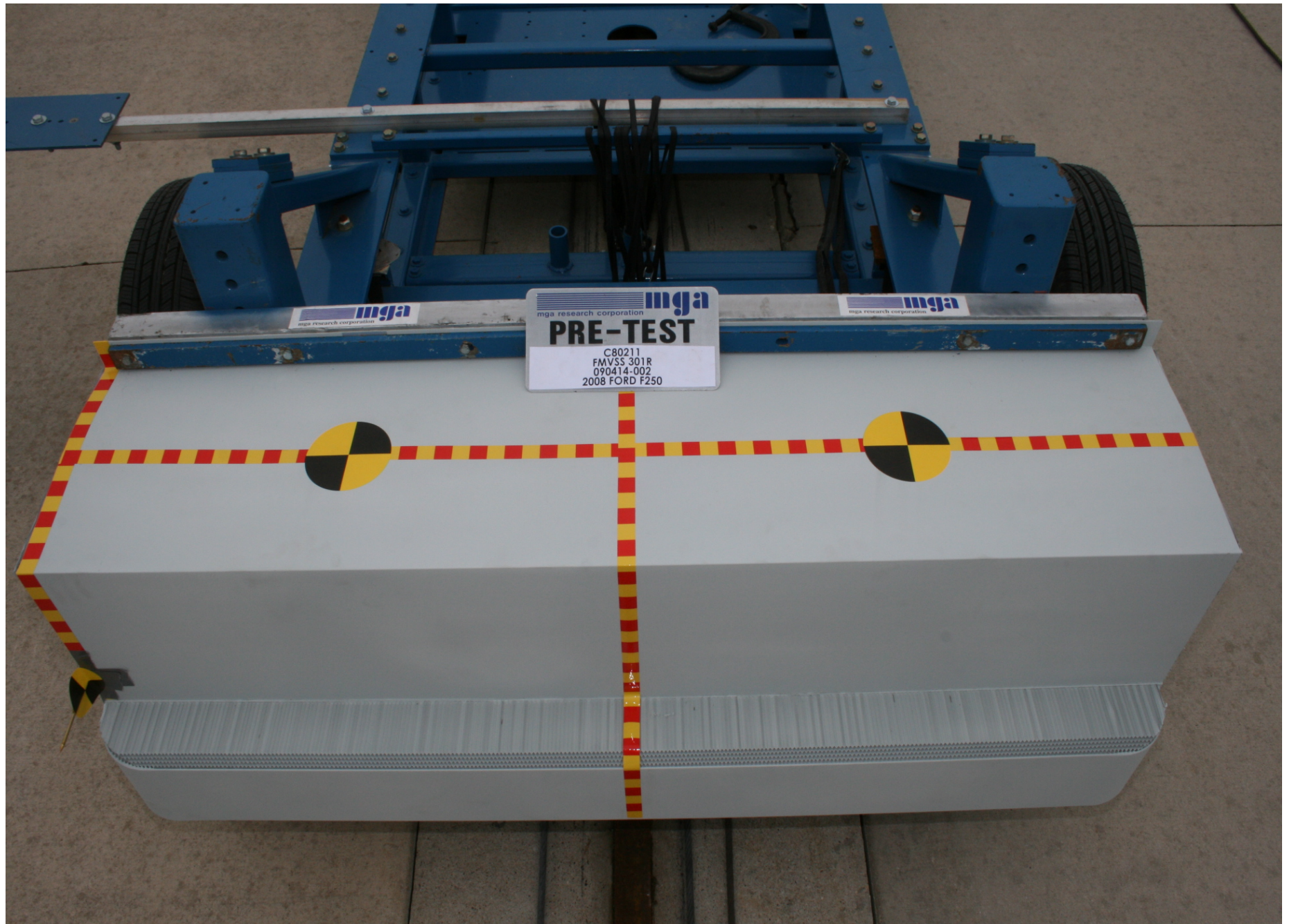
Post-Test $\frac{3}{4}$ Right Side View of MDB



Pre-Test ¾ Left Side View of MDB



Post-Test ¾ Left Side View of MDB



Pre-Test Top View of MDB



A-38.

Post-Test Top View of MDB



Static Rollover at 90 Degrees

A-40.



Static Rollover at 180 Degrees

A-4.1.



Static Rollover at 270 Degrees



Static Rollover at 360 Degrees